

GONYAULAX GRINDLEYI SP. NOV.:

A DINOFLAGELLATE CAUSING A RED TIDE AT ELANDS BAY,
CAPE PROVINCE, IN DECEMBER 1966.

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Towards the end of December 1966, a red tide was reported in the vicinity of Elands Bay, which lies about 30 miles South of Lamberts Bay in the South West Cape. The causative organism was found to be an undescribed species of the dinoflagellate genus *Gonyaulax* Diesing. A joint paper on the ecology of this red tide by Dr. J. R. Grindley of the Port Elizabeth Museum and Oceanarium, and Miss E. A. Nel of the Division of Sea Fisheries, Sea Point, is in preparation.

A feature of particular interest is that shellfish, collected in waters affected by this *Gonyaulax* bloom, yielded a paralytic toxin. These investigations were carried out by Professor N. Sapeika of the Pharmacology Department, University of Cape Town Medical School.

Gonyaulax grindleyi Reinecke, sp. nov.

A speciebus aliis ob parvitatem cum patella apicali prima lata, patella ocludenda magna, patellis magnis reticulatis, poro in quoque polygono reticuli, differt.

Body subsphaeroidal, longitudinal axis slightly exceeding equatorial axis, the former in length 28—43 μ , the latter 25—35 μ ; *girdle* displacement about one girdle width, no overhang of the two ends, girdle lists prominent; *epitheca* conical, no apical horn; *hypotheca* subhemisphaerical, in dorsal view up to 1.5 times height of epitheca; *plate formula*: 3', 1a, 6'', 6, 6''', 1p, 1''''; number of intermediate plates of ventral area difficult to determine; ventral apical broad as in *G. polyedra* Stein, closing plate exceptionally large; markings of mature thecae reticulate, similar to those in *G. digitale* (Pouchet) Kofoid, but not as regular, with raised ridges which form a polygonal pattern on the larger plates, with a small pore in each polygon; where the corners of the polygons meet,

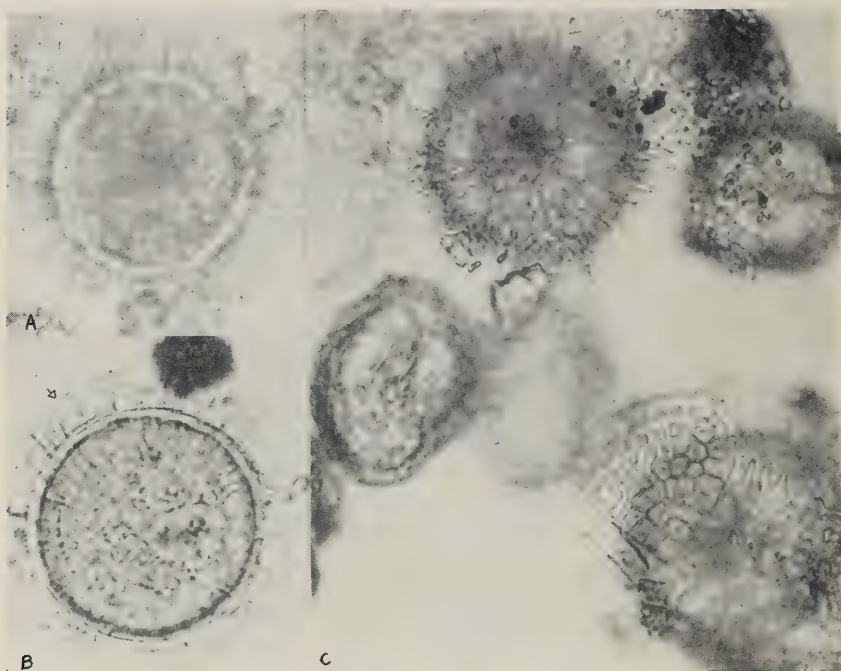


PLATE 1.

Cysts found in water with *G. grindleyi* bloom.

A and *B*, cysts seen in optical section: in *B*, the arrow indicates a possible membrane around the spines; *C*, two cysts seen in surface view: note postcingular plate lying on one, the other is also shown in *A*. (Diameter of cysts excluding spines: 36μ).

there may be a slight projection of the ridge; young thecae smooth walled, the plates clearly visible; markings on girdle plates of mature thecae faint.

HOLOTYPE: Iconotype Fig. 1. Type material lodged at South African Museum, Cape Town.

LOCALITY: Elands Bay, Cape Province, Dec. 1966, J. R. GRINDLEY.

It is difficult to place this species in any of the subgenera described by Kofoid (1911). The closing plate appears to be carried over to the dorsal side as in the subgenus *Steiniella* (Schütt) Kofoid, but in other features it has greater affinities with the subgenus *Gonyaulax* (Diesing) Kofoid.

Spiny cysts, (Plate 1), were also found in the red tide samples, and in one

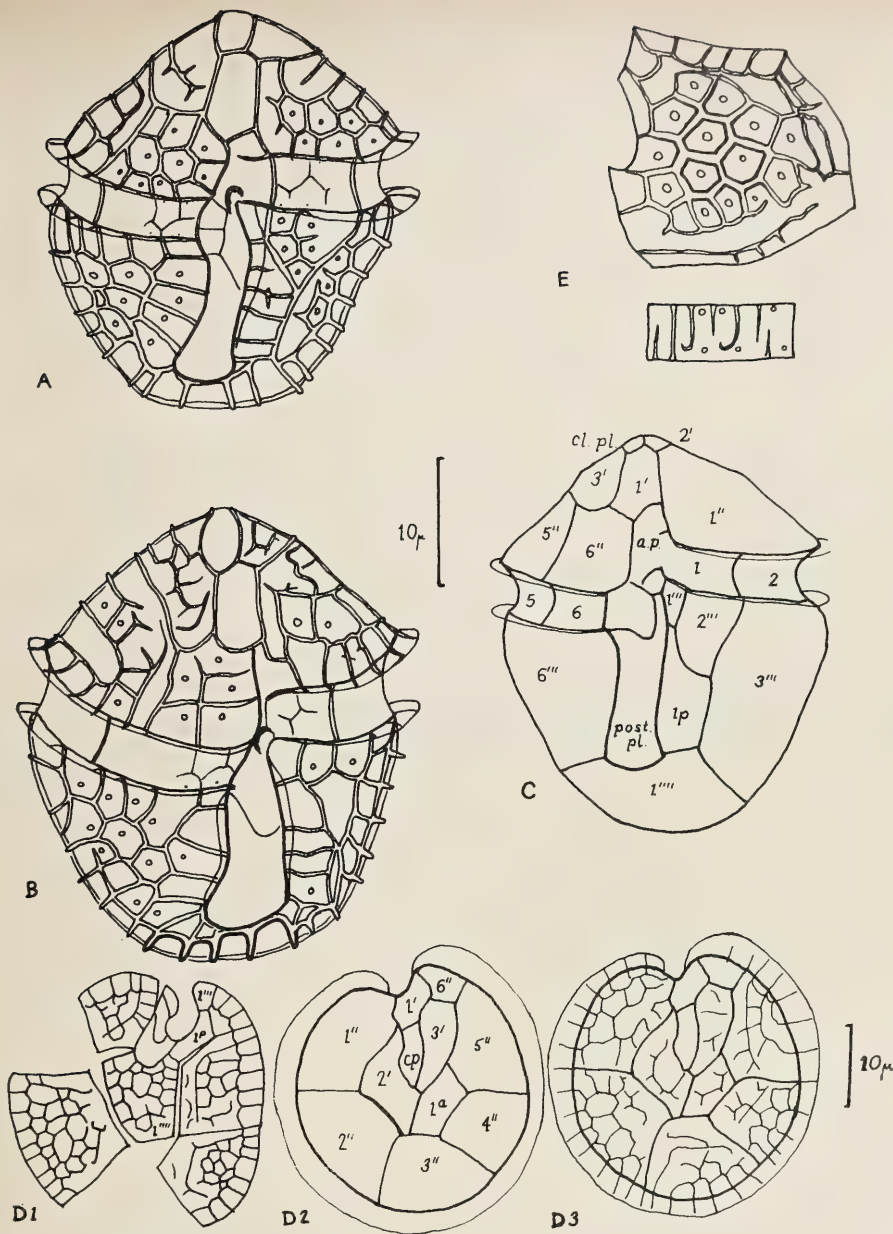


FIG. 1.

Gonyaulax grindleyi, from Elands Bay. *A* and *B*, older thecae seen ventrally; in *A*, the intermediate plates of the ventral area are better seen; *C*, young theca showing arrangement of plates: cl. pl., closing plate; 1'—3', apical plates; 1''—6'', precingular plates; 1—6, girdle plates; 1'''—6''', postcingulars; 1p, posterior intercalary plate; 1'''' antapical plate; a.p., anterior plate of ventral area; post. pl., posterior plate of same; *D*1, antapical view of hypothecal plates; *D*2 and *D*3, apical view of epithecal plates; cp, closing plate; la, anterior intercalary plate; *E*, antapical plate and girdle plate 3 or 4 from mature thecae.

such sample kept in a domestic refrigerator for a week, there was a noticeable increase in the numbers of these cysts while cells of *G. grindleyi* were no longer evident. Unfortunately, no culture studies were made and no intermediate stages were observed, so there is no direct evidence that they are, in fact, cysts of this new dinoflagellate. The diameter of the cysts examined was 32–36 μ , excluding the spines, which were 6–9 μ in length and more abundant than those on the cyst of *G. polyedra*, (Evitt and Davidson, 1964).

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